

VENTILATION IN VENTILATED CLADDING WITH FIBER CEMENT BOARDS IS CRITICALLY IMPORTANT

In modern ventilated façade systems, fiber cement boards are widely appreciated for their durability, appearance, and versatility. However, achieving long-term façade performance requires more than simply selecting high-quality panels or adhesives.

Proper Ventilation Is Essential

At TWEHA®, we have many years of international experience with the professional bonding of fiber cement façade panels. This experience has shown one thing repeatedly: When ventilation within the façade cavity is insufficient, serious façade deformation problems can occur — regardless of the installation method. That is why ventilation design deserves maximum attention in every ventilated cladding project.

Professional Bonding Requires Professional Design

When a façade panel is correctly bonded using the professional TWEHA® adhesive system, adhesive failure itself is not the cause of panel detachment.

Like all façade installation systems, successful bonding depends on:

- Technical knowledge;
- Correct detailing;
- Accurate execution;
- Proper ventilation;
- High-quality workmanship.

Equally important is clear technical guidance from the supplier to ensure the façade system is installed according to the required specifications.

Why Ventilation Is So Important

Ventilated façades are designed to create continuous airflow behind the façade panels.

This airflow ensures that:

- Moisture can evaporate;
- Temperature differences are balanced;
- Humidity levels remain stable;
- The façade construction can “breathe.”

However, when ventilation is obstructed or insufficient — also referred to as:

Frustrated Ventilation, the climate conditions at the front of the panel and inside the cavity begin to differ significantly.

This creates stress differences within the fiber cement board itself.

The Consequences of Poor Ventilation

When the cavity behind the façade is not properly ventilated, the airflow becomes too limited, and the cavity air is refreshed less effectively than the outside air.

This leads to differences in:

- Temperature;
- Humidity;
- CO₂ concentration;
- Moisture balance.

Over time, these unequal conditions affect the fiber cement board differently on each side of the panel.

Differential Carbonation

One of the most important phenomena affecting fiber cement panels is Differential Carbonation

Because the CO₂ concentration inside the cavity differs from the outside air, the chemical reaction process within the panel develops differently on both sides.

As a result:

- The façade side of the panel shrinks differently than the cavity side;
- Internal stress develops;
- The panel begins to curve or warp.

Moisture Imbalance Causes Panel Curling

Ventilation problems also create unequal humidity conditions behind and in front of the façade panel.

This leads to uneven drying behavior.

The driest side of the panel — usually the exterior visible side — will shrink more rapidly than the cavity side.

This unequal shrinkage causes:

- Curving;
- Warping;
- Permanent deformation of the façade panel.

Why Corners Are Most Vulnerable

The effects of panel deformation become most visible at the panel corners.

As the panel curls, extreme peeling forces develop at the adhesive connection points or mechanical fixings.

This can eventually lead to:

- Bond failure;
- Panel cracking;
- Damage to the substrate;
- Structural instability;
- Façade detachment.

In many cases, the adhesive itself is not the weak point — the real cause is the excessive stress generated by poor ventilation design.

Ventilation Is Not Optional — It Is Part of the System

A ventilated façade only functions correctly when the ventilation cavity performs as intended.

This means:

- Sufficient air cavity depth;
- Open ventilation at top and bottom;
- Proper joint detailing;
- Unobstructed airflow;
- Correct moisture management.

Without these elements, even the highest-quality façade materials may experience premature problems.

Long-Term Façade Performance Starts with Correct Engineering

Fiber cement façade systems can perform exceptionally well for decades when designed and installed correctly.

The combination of:

- Professional bonding;
- Proper ventilation;
- Correct detailing;
- High-quality materials;

ensures:

- Stable façade behavior;
- Reduced internal stresses;
- Long-term durability;
- Reliable bonding performance.

TWEHA®: Experience in Bonded Ventilated Façades

At TWEHA®, we understand the complex interaction between:

- Fiber cement materials;
- Moisture balance;
- Ventilation behavior;
- Adhesive performance.

That knowledge allows us to support façade professionals with reliable adhesive systems and technical expertise for durable ventilated façade constructions.

Because in bonded ventilated cladding, ventilation is not just important — it is fundamental to the success of the entire façade system.

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